TS6FN-C

SONAR NOISE RECORDER

1. GENERAL. This procurement requires a portable, self contained sonar test set capable of measuring both noise and coherent signals detected by shipboard sonar. The detected signals will be displayed and plotted as a function of bearing or time. The equipment shall also have a built-in tape cassette recorder capable of storing measurements made by the sonar noise recorder.

2. CLASSIFICATION. The equipment shall meet the requirements of MIL-T-28800, Type III, Class 5, Style E, Color R for Navy shipboard, submarine, and shore applications with the following modifications and exceptions:

a. The relative humidity requirement is limited to 95% noncondensating.

b. The operating and nonoperating altitude requirements are not invoked.

c. The EMI requirement is not invoked.

d. The warm-up time is extended to one hour.

3. OPERATIONAL REQUIREMENTS. The equipment shall be capable of performing within the parameters and accuracies specified herein.

3.1 Y-Axis (signal channel).

3.1.1 Voltage range. 1 _Vrms (-120 dB) to 7 Vrms (17 dB) with a maximum crest factor of 5.

3.1.2 Dynamic range. Selectable to be 60 dB or 120 dB; full scale from -60 dB to +20 dB in 1 dB steps

3.1.3 Input impedance. Greater than or equal to 1 M_ shunted by no more than 50 pF.

3.1.4 Frequency response. _1 dB from 500 Hz to 15 kHz with constant amplitude signal applied to the input probe.

3.1.4.1 High pass filter. With 18 dB/octave roll-off.

3.1.4.2 Low pass filter. With 12 dB/octave roll-off.

3.1.5 Linearity. Within 0.5 dB over the 120 dB measurement range from 500 Hz to 15 kHz.

3.1.6 Resolution. 0.2 dB or better.

3.1.7 Equivalent noise input. With input terminated with 1 k_ the

noise measured will be less than 2 _Vrms.

3.1.8 Time constants. Selectable at 10 or 100 msec.

3.1.9 Overshoot. The Y-axis overshoot shall be 1 dB or less for a 10 dB level change.

3.1.10 Pen writing speed. At least 150 dB/sec at the 10 msec time constant and 15 dB/sec at the 100 msec time constant.

3.2 X-Axis.

3.2.1 Operating modes. The equipment shall be capable of operating as a function of time and as a function of bearing with the equipment driving the sonar synchro system.

3.2.2 Bearing ranges.

3.2.2.1 360_. Full scale equals 360_, origin selectable at any bearing in 1_ steps.

3.2.2.2 72_. Full scale equals 72_, origin selectable at any bearing in 1_ steps.

3.2.3 Sweep.

3.2.3.1 Bearing mode. Full scale sweep times of 30, 60 or 120 sec in either normal or expanded mode.

3.2.3.2 Time mode. Full scale sweep times of 12, 30, 60 or 120 sec in either normal or expanded mode.

3.2.3.3 Halt and reverse. The equipment shall have the capability to halt, reverse direction and continue the sweep, in either the bearing or time mode.

3.2.4 Return time. The pen return time shall not exceed 12 sec.

3.2.5 Synchro output. The synchro output shall operate into 1-speed or 36-speed sonar synchro system, 115V reference, 90V line to line, at 400 Hz; 1.5 VA per stator, maximum. The reference and signal leads must be fuse protected against over current or over voltage conditions.

3.2.5.1 Synchro output interface. The synchro output interface cable must be capable of direct connection for the following sonar system configurations.

3.2.5.1.1 Cable A. Cable must be at least 10 feet long with eight single conductors of at least 18 inches in length terminated with pin jacks with the following connections:

Pin	Signal
A	1X-S1
B	1X-S2
C	1X-S3

D	36X-S1
E	36X-S2
F	36X-S3
G	R2
H	R1

3.2.5.1.2 Cable B. Cable must be at least 10 feet long terminated with a MS3106A-18-1P connector with the following connections:

Pin	Signal
A	1X-S1
B	1X-S2
C	1X-S3
D	36X-S1
E	36X-S2
F	36X-S3
G	R2
H	R1

3.2.5.1.3 Cable C. Cable must be at least 10 feet long terminated with a MS3106A-18-1P connector with the following connections:

Pin	Signal
A	1X-S3
B	1X-S2
C	1X-S1
D	36X-S3
E	36X-S2
F	36X-S1
G	R1
H	R2

3.2.6 Accuracy. _1_ for the 360_ range and _0.3_ for the 72_ expanded range

3.2.7 Resolution. 0.2_ or better in the bearing modes; 15 msec or better for the fastest speed in the time mode; 60 msec or better for the slowest speed in the time mode.

3.3 Recorder paper and pen.

3.3.1 Paper type. Preprinted single sheet with degrees and decibels scales

3.3.2 Paper holddown. Positive paper holddown must be provided.

3.3.3 Paper positioning. Guide lines shall be provided for accurately positioning recording paper.

3.3.4 Pen type. Disposable cartridge with fiber tip.

3.4 Tape recorder built-in cassette type.

3.4.1 Tape speed. At least 10 inches/second.

3.4.2 Data format. Each record will correspond to one sweep of the X-axis and consist of one set of parameters followed by the measured data.

3.4.3 Tape capacity. At least 30 records (sweeps) per cassette.

3.4.4 Read/Store time. Less than 10 seconds after starting point is found.

3.4.5 Search speed. At least 40 inches/second.

3.4.6 Cassette. Magnetic tape shall be in cassette format and capable of operating from 0_C to +55_C.

3.4.7 File identification. Access to the files shall be controlled by operator entry of a file number. New data will be recorded at the end of the last record or in place of a previous file identified by the operator.

3.5 Built-In testing.

3.5.1 Self-Test. An automatic self test function shall be provided.

3.5.2 Adjustments. The pen shall be capable of being set to origin and full scale of each axisunder operator control for internal adjustments.

3.6 Displays and controls.

3.6.1 Display. 20 character minimum, alphanumeric readout; used for dialogue with the operator, display of entry data and display of measurement data.

3.6.2 Keyboard. The recorder shall be provided with either a keypad or push buttons for data entry as necessary to operate the equipment.

3.6.3 Trigger output. A TTL pulse for triggering other equipments shall be provided on the front panel to indicate when a recording is started.

4. GENERAL REQUIREMENTS.

4.1 Power. 115/230 Vac _10%, 50/60 Hz, 200W maximum.
4.2 Dimensions. The total volume shall not exceed 63,910 cm_(3,900 in^3).

4.3 Weight. The total weight shall not exceed 27.3 kg (60 lbs).

4.4 Calibration interval. Built-in calibration shall be capable of qualifying for the Navy "No Calibration Required" label.

4.5 Remote control. The generator shall be capable of being remotely controlled via the IEEE-488 interface bus, operating as both a talker and listener, having at least the following subset of bus functions. AH1, L4, SH1, T6, SR1, DC1, and RL1.

4.6 Connections. All external connections shall be keyed to prevent accidental or improper connection.